

SCREEN FOR A PULP STRAINER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a screen, and more particularly to a screen for a pulp strainer that has an excellent efficiency for filtering the pulp.

2. Description of Related Art

With reference to Fig. 6, a conventional screen for a pulp strainer in accordance with the prior art comprises a tubular body (30), multiple slots (not numbered) and multiple reinforcing rings (35). The tubular body (30) has an axis (not numbered) and a wall (31). The wall has an outer surface (not numbered) and a longitudinal undulating inner surface (not numbered) with multiple wave crests (not numbered) and troughs (not numbered) arranged along the axis in an alternating arrangement. The slots are longitudinally defined through the wall (31) and are located respectively in the troughs of the undulating inner surface. Each slot has an inlet (322) and an outlet (321). The inlet (322) of each slot is defined in the inner surface of the wall (31), and the outlet (321) is defined in the outer surface of the wall (31). The inlet (321) of each slot has a width smaller than that of the outlet (322). The reinforcing rings (35) are mounted around the tubular body (30) on the outer surface of the wall (31) to enhance the structural strength of the screen.

In operation, the screen is put into an outer housing and a stirring device is mounted in the screen to stir the pulp received in the screen. Some of the pulp that is smaller than the width of the inlets (322) will be allowed to pass through the slots, and a filtering effect to the pulp is provided.

1 However, because the slots in the conventional screen are longitudinally
2 defined in the tubular body (30), the pulp does not easily pass through the slots
3 that are substantially perpendicular to the flowing direction of the pulp stirred by
4 the stirring device. In addition, with the arrangement of the reinforcing rings (35),
5 parts of the slots will be blocked. Consequently, the area of the slots for the pulp
6 to pass through is reduced, and the efficiency of filtering the pulp provided by
7 the conventional screen is low.

8 In addition, because the wave crests of the undulating inner surface are
9 substantially perpendicular to the flowing direction of the pulp, the wave crests
10 will be easily worn off after a period of use. After the wave crests of the
11 undulating inner surface have been worn off, the vortexes in the flowing pulp
12 generated due to the interruption effect provided by the wave crests is reduced.
13 Therefore, the speed of the flowing pulp on the inner surface of the wall (31) is
14 decreased, and the pulp travelling at a low speed easily blocks the slots.

15 To overcome the shortcomings, the present invention tends to provide a
16 screen to mitigate or obviate the aforementioned problems.

17 SUMMARY OF THE INVENTION

18 The main objective of the invention is to provide a screen for a pulp
19 strainer that can improve the efficiency for filtering the pulp. The screen has a
20 tubular body, multiple columns of slots and multiple strips. The body has an axis,
21 a wall with an inner surface and an outer surface and multiple columns of
22 undulating segments formed on the wall along the axis of the body. Each
23 undulating segment has multiple wave crests and troughs perpendicular to the
24 axis of the body and arranged in alternating manner. The columns of slots are

1 longitudinally defined through the wall of the tubular body. Each slot is defined
2 in one of the troughs of the undulating segments on the wall and has an inlet and
3 an outlet. The inlet has a height smaller than that of the outlet. The strips are
4 mounted on the wall and are located respectively between adjacent columns of
5 undulating segments.

6 Other objects, advantages and novel features of the invention will
7 become more apparent from the following detailed description when taken in
8 conjunction with the accompanying drawings.

9 BRIEF DESCRIPTION OF THE DRAWINGS

10 Fig. 1 is a perspective view of a screen for a pulp strainer in accordance
11 with the present invention;

12 Fig. 2 is an enlarged perspective view in partial section of part of the
13 tubular body with slots of the screen in Fig. 1;

14 Fig. 3 is an enlarged cross sectional top plan view of the tubular body of
15 the screen in Fig. 1;

16 Fig. 4 is an enlarged cross sectional side plan of part of the tubular body
17 with slots of the screen in Fig. 1;

18 Fig. 5 is an enlarged cross sectional top plan view of a second
19 embodiment of a tubular body of a screen in accordance with the present
20 invention; and

21 Fig. 6 is a perspective view of a conventional screen for a pulp strainer in
22 accordance with the prior art.

23 DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

24 With reference to Figs. 1 and 2, a screen for a pulp strainer in accordance

1 with the present invention comprises a tubular body (10), multiple columns of
2 slots (20), multiple strips (25) and optionally at least one reinforcing ring (not
3 numbered). The body (10) has an axis (not numbered) and a wall (11) with an
4 outer surface (not numbered) and an inner surface (not numbered). The wall (11)
5 has multiple columns of undulating segments (12) formed along the axis of the
6 body (10). Each undulating segment (12) has multiple wave crests (not
7 numbered) and troughs (not numbered) perpendicular to the axis of the body (10)
8 and arranged in an alternating manner. In a first embodiment, the undulating
9 segments (12) are formed on the inner surface of the wall (11).

10 With further reference to Figs. 3 and 4, the slots (20) are laterally defined
11 respectively in the troughs of the undulating segments (12) on the wall (11).
12 Each slot (20) has an inlet (21) and an outlet (22). Each inlet (21) has a height
13 smaller than that of the corresponding outlet (22). In the first embodiment, the
14 inlet (21) is defined in the inner surface of the wall (11), and the outlet (22) is
15 defined in the outer surface of the wall (11).

16 The strips (25) are securely mounted on the wall (11) and are located
17 respectively between adjacent columns of undulating segments (12). In the first
18 embodiment, the strips (25) are securely mounted on the inner surface of the wall
19 (11) by a welding process with weld (251).

20 The optional at least one reinforcing ring is mounted around the tubular
21 body (10) on the outer surface of the wall (11).

22 In the first embodiment, a stirring device (not shown) is received in the
23 screen and an outer housing (not shown) is mounted around the screen to achieve
24 a pulp strainer. After the pulp being put into the screen and the stirring device

1 being switched on, some of the pulp particles that are smaller than the height of
2 the inlets (21) of the slots (20) are allowed to pass through the slots (20).
3 Accordingly, a filtering effect to the pulp is provided. Because the slots (20) are
4 laterally defined in the wall (11) of the tubular body (10) and are substantially
5 along the flowing direction of the pulp stirred by the stirring device, the pulp will
6 pass through the slots (20) in ease. In addition, with the arrangement of the
7 lateral slots (20), the total area of the slots (20) for the pulp passing through is
8 enlarged even though there are reinforcing rings mounted on the tubular body
9 (10). In an experiment, a screen in accordance with the present invention has
10 about 10% increased area compared to a conventional screen of the same size.
11 Thus, the efficiency for filtering the pulp is improved.

12 In addition, with the arrangement of the strips (25), vortexes are
13 generated on the inner surface of the wall (11) when the pulp passes over the
14 strips (25). Accordingly, the speed of the pulp on the inner surface of the wall (11)
15 is increased, and this can keep the inlets (21) of the slots (20) from being blocked
16 by the pulp. Moreover, the strips (25) also provide a reinforcing effect to the
17 structural strength of the screen, so the reinforcing rings on the outer surface of
18 the tubular body (10) can be optionally omitted.

19 With reference to Fig. 5, in a second embodiment, the undulating
20 segments are formed on the outer surface of the wall (11') of the tubular body,
21 and the strips (25') are mounted on the outer surface of the wall (11'). The inlets
22 (21') of the slots (20') are defined in the outer surface of the wall (11'), and the
23 outlets (22') are defined in the inner surface of the wall (11').

24 In the second embodiment, an outer housing (not shown) is mounted

1 around the screen and a stirring device (not shown) is mounted between the outer
2 housing and the screen to achieve another pulp strainer. The pulp is put into the
3 space between the outer housing and the screen and is stirred by the stirring
4 device to flow into the screen through the slots (20').

5 Even though numerous characteristics and advantages of the present
6 invention have been set forth in the foregoing description, together with details
7 of the structure and function of the invention, the disclosure is illustrative only,
8 and changes may be made in detail, especially in matters of shape, size, and
9 arrangement of parts within the principles of the invention to the full extent
10 indicated by the broad general meaning of the terms in which the appended
11 claims are expressed.